

REMARKS

I. Introduction

Claims 1 to 8 and 10 to 21 are pending in the present application. In view of the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

II. Amendment to the Specification

The Specification has been amended herein without prejudice to delete the replacement paragraph that was added to the Specification in the Amendment submitted on May 21, 2007. No new matter has been added.

III. Rejection of Claims 1 to 8, 10, and 18 to 20 Under 35 U.S.C. § 102(e)

Claims 1 to 8, 10, and 18 to 20 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,720,268 ("Laermer et al."). It is respectfully submitted that Laermer et al. does not anticipate these claims for at least the following reasons.

Claim 1 relates to a method of etching a structure into an etching body using a plasma and recites injecting a high-frequency power into the etching body via a substrate electrode and ***refraining from injecting the high-frequency power into the etching body via the substrate electrode in response to an at least approximately ambipolar plasma being present.***

Laermer et al. relates to a method of etching structures into an etching body using a plasma. The Office Action contends that the switching on and off of the high-frequency generator as disclosed at column 10, lines 48 to 52 of Laermer et al. constitutes refraining from injecting the high-frequency power into the etching body in response to the presence of ambipolar plasma. However, the Office Action **admits** that Laermer et al. does not discuss an ambipolar plasma. Office Action, page 3 ("As to the ambipolar plasma, it would have been obvious to include the plasma [sic] an ambipolar status because plasma is nothing but excited or reactive species (atoms, radicals and ions, which could be in ambipolar in nature [sic]."). Indeed, Laermer et al. makes no mention whatsoever of an ambipolar plasma. Thus, it is readily apparent that Laermer et al. does not disclose, or even suggest, a step of ***refraining from injecting a high-frequency power into an etching body via a***

substrate electrode in response to an at least approximately ambipolar plasma being present, as recited in claim 1.

Further, Laermer et al. does not disclose, or even suggest, **performing a pulsing of the plasma at a frequency of at least 500 Hz**, as required by independent claim 7, or **establishing a fixed, integral phase ratio between a pulse train injected into the plasma and a pulse train injected into to the etching body**, as required by independent claim 4.

It is, of course, “well settled that the burden of establishing a prima facie case of anticipation resides with the [United States] Patent and Trademark Office.” Ex parte Skinner, 2 U.S.P.Q.2d 1788, 1788 to 1789 (Bd. Pat. App. & Inter. 1986). To anticipate a claim, each and every element as set forth in the claim must be found in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claim.” Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). As set forth above, Laermer et al. does not disclose all of the features included in any of claims 1, 4, and 7. As such, it is respectfully submitted that Laermer et al. does not anticipate any of claims 1, 4, and 7 or any of dependent claims 2, 3, 5, 6, 8, 10, and 18 to 20, each of which ultimately depends from, and therefore includes all of the features of, one of claims 1, 4, and 7.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

**IV. Rejections Under 35 U.S.C. § 103(a)
Are Improper Under 35 U.S.C. § 103(c)**

Regarding the rejections raised under 35 U.S.C. § 103(a) based on U.S. Patent No. 6,720,268, the present application and U.S. Patent No. 6,720,268 were, at the time the invention of the present application was made, owned by Robert Bosch GmbH. Accordingly, all rejections raised under 35 U.S.C. § 103(a) based on U.S. Patent No. 6,720,268 are improper under 35 U.S.C. § 103(c). Withdrawal of all such rejections is therefore respectfully requested.

V. Rejection of Claims 11 to 15 Under 35 U.S.C. § 103(a)

Claims 11 to 15 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Laermer et al. and U.S. Patent No. 5,290,383 (“Koshimizu”). Notwithstanding the improper nature of the present rejection for the reasons set forth above in Section IV, Applicants respectfully submit that the combination of Laermer et al. and Koshimizu does not render unpatentable claims 11 to 15 for at least the following additional reasons.

Laermer et al. relates to a method of etching structures into an etching body using a plasma. Koshimizu relates to a plasma-process system with an improved end-point detecting scheme. Nowhere does the combination of Laermer et al. and Koshimizu disclose, or even suggest, at least at one time at which an at least approximately ambipolar plasma is present, adding to the plasma an inert gas that is at least one of light and easily ionizable, as required by independent claim 11. The Office Action continues to refer to col. 14, lines 29 to 41, where Koshimizu states that certain gases are introduced into the etching chamber prior to application of power to the electrodes 106 and 108. However, as Applicants previously set forth in the “Response” dated December 12, 2007 and the “Amendment” dated June 11, 2008, Koshimizu does not state that these gases are introduced at a time when at least approximately ambipolar plasma is present in the chamber. On the contrary, in Koshimizu the gases are introduced even before generation of the plasma in the chamber. See col. 14, lines 43 to 47.

As indicated above, the combination of Laermer et al. and Koshimizu does not disclose, or even suggest, all of the features of independent claim 11. As such, it is respectfully submitted that the combination of Laermer et al. and Koshimizu does not render unpatentable claim 11.

Claims 12 to 15 ultimately depend from claim 11 and therefore include all of the features recited in claim 11. As such, it is respectfully submitted that the combination of Laermer et al. and Koshimizu does not render unpatentable these dependent claims for at least the same reasons set forth above in support of the patentability of claim 11.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

VI. Rejection of Claims 16 and 17 Under 35 U.S.C. § 103(a)

Claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Laermer et al. and U.S. Patent No. 5,779,925 (“Hashimoto et al.”). Notwithstanding the improper nature of the present rejection for the reasons set forth above in Section IV, Applicants respectfully submit that the combination of Laermer et al. and Hashimoto et al. does not render unpatentable claims 16 and 17 for at least the following additional reasons.

Hashimoto et al. purportedly relates to plasma processing with less damage. The Office Action alleges that Hashimoto et al. disclose that the RF bias is synchronized with the on/off modulation in order to reduce charging damage without lowering the throughput. Office Action, page 5. However, nowhere does the combination of Laermer et al. and Hashimoto et al. disclose, or even suggest, the specific relationship between the plasma pulse frequency and the power injected into the etching body required by independent claim 16, i.e., setting as a plasma pulse frequency an odd-numbered multiple of a frequency of a low-frequency modulation of a high-frequency power injected into the etching body via a substrate electrode, and synchronizing the first modulation and the low-frequency modulation with one another so that n plasma pulses ($n = 1, 2, 3, \dots$) fall in each pulse injected into the etching body using the substrate electrode while $n + 1$ plasma pulses occur during a pause in an energy injection into the etching body.

As indicated above, the combination of Laermer et al. and Hashimoto et al. does not disclose, or even suggest, all of the features recited in claim 16. As such, the combination of Laermer et al. and Hashimoto do not render unpatentable independent claim 16.

Claim 17 depends from claim 16 and therefore includes all of the features recited in claim 16. As such, it is respectfully submitted that the combination of Laermer et al. and Hashimoto does not render unpatentable claim 17 for at least the same reasons set forth above in support of the patentability of claim 16.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

VII. Rejection of Claim 21 Under 35 U.S.C. § 103(a)

Claim 21 was rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Laermer et al. and U.S. Patent No. 4,799,991 (“Dockrey”).

Notwithstanding the improper nature of the present rejection for the reasons set forth above in Section IV, Applicants respectfully submit that the combination of Laermer et al. and Dockrey does not render unpatentable claim 21 for at least the same reasons submitted above in support of the patentability of claim 1, from which claim 21 depends. Specifically, Applicants respectfully submit that the combination of Laermer et al. and Dockrey does not disclose, or even suggest, refraining from injecting a high-frequency power into the etching body via a substrate electrode in response to an at least approximately ambipolar plasma being present, as required by claim 1. Dockrey purportedly relates to a process for differentially etching polycrystalline silicon. Dockrey does not remedy the above-noted deficiencies of Laermer et al. Nor is Dockrey relied upon for remedying the above-noted deficiencies of Laermer et al. Therefore, withdrawal of the present rejection is respectfully requested.

VIII. Conclusion

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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